

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method of compensating mask/reticle data for lithographic process distortions, comprising the acts of:

reading a first set of mask/reticle data that defines at least one feature to be created lithographically;

performing a simulation of the etch effects that would occur if a wafer is created using a mask/reticle corresponding to the first set of mask/reticle data;

using the results of the etch simulation to create a second set of mask/reticle data that defines at least one new or modified feature to be created lithographically; and

performing optical process correction (OPC) using the second set of mask/reticle data as an input to create a third set of mask/reticle data.

2. The method of Claim 1, comprising the additional act of exporting the third set of mask/reticle data to a mask/reticle writer to manufacture a corresponding mask/reticle.

3. The method of Claim 1, in which the step of performing a simulation includes accessing a set of predetermined rules for the etch process.

4. The method of Claim 1, in which the step of performing a simulation includes accessing a table of predetermined values for the etch process.

5. A method of compensating mask/reticle data for lithographic process distortions, comprising the acts of:

reading a first set of mask/reticle data that defines at least one feature to be created lithographically;

performing a simulation of the etch effects that would occur if a wafer is created using a mask/reticle corresponding to the first set of mask/reticle data;

calculating etch biases from the etch simulation result; and

applying the etch biases within an optical process correction (OPC) loop that adjusts the mask/reticle data for optical/resist process distortions.

6. The method of Claim 5, in which the step of performing a simulation includes accessing a set of predetermined rules for the etch process.

7. The method of Claim 5, in which the step of performing a simulation includes accessing a table of predetermined values for the etch process.

8. A computer-readable media having a sequence of programmed instructions stored thereon that when executed by a computer causes the computer to perform the acts of:

reading a first set of mask/reticle data that defines at least one feature to be created lithographically;

performing a simulation of the etch effects that would occur if a wafer is created using a mask/reticle corresponding to the first set of mask/reticle data and using the results of the etch simulation to create a second set of mask/reticle data that defines at least one new or modified feature to be created lithographically; and

performing optical process corrections on the second set of mask/reticle data.

9. The computer-readable media of Claim 8, wherein the sequence of programmed instructions causes the computer to export OPC corrected mask/reticle data to a mask/reticle data to manufacture a corresponding mask/reticle.

10. The computer readable media of Claim 8, in which the step of performing a simulation includes accessing a set of predetermined rules for the etch process.

11. The computer readable media of Claim 8, in which the step of performing a simulation includes accessing a table of predetermined values for the etch process.

12. A computer readable media having a sequence of programmed instructions stored thereon that when executed by a computer causes the computer to perform the acts of:

reading a first set of mask/reticle data that defines at least one feature to be created lithographically;

performing a simulation of etch effects that would occur if a wafer is created with a mask/reticle corresponding to the first set of mask/reticle data;

calculating etch biases from the etch simulation; and

applying the etch biases in an optical process correction (OPC) loop that adjusts the mask/reticle data for optical/resist process distortions.

13. The computer readable media of Claim 12, in which the step of performing a simulation includes accessing a set of predetermined rules for the etch process.

14. The computer readable media of Claim 12, in which the step of performing a simulation includes accessing a table of predetermined values for the etch process.

15. A method of producing data for a lithographic mask/reticle, comprising the acts of:

receiving a set of data for a target layer that defines a pattern of objects to be created lithographically;

performing an etch simulation of a wafer formed in accordance with the target layer data;

calculating an error in the pattern of objects formed on the wafer as a result of etch distortions;

using the error to produce a second set of data defining a new target layer; and

providing the data for the new target layer as an input to an optical process correction (OPC) algorithm to produce data for a mask/reticle that, when used in a

lithographic process, will produce a set of objects on a wafer that substantially matches the new target layer.

16. The method of Claim 15, wherein the optical process correction algorithm corrects the third set of data for optical and resists distortions.

17. In the method of Claim 15, wherein the optical process correction algorithm simulates optical process distortions in a lithographic process; and
adjusting the third set of data that defines a pattern of objects to be created lithographically until a simulation of a pattern created lithographically from the third set of data substantially matches the new target layer.

18. The method of Claim 15, in which the step of performing a simulation includes accessing a set of predetermined rules for the etch process.

19. The method of Claim 15, in which the step of performing a simulation includes accessing a table of predetermined values for the etch process.

20. A device that is formed on a wafer created by the acts of:
reading a first set of mask/reticle data that defines at least one feature to be created lithographically;
performing a simulation of the etch effects that would occur if a wafer is created using a mask/reticle corresponding to the first set of mask/reticle data;
using the results of the etch simulation to create a second set of mask/reticle data that defines at least one new or modified feature to be created lithographically;
performing optical process correction (OPC) using the second set of mask/reticle data as an input to create a third set of mask/reticle data;
exporting the third set of mask/reticle data to a mask/reticle writer to manufacture a corresponding mask/reticle; and
using the mask/reticle to create the device on the wafer.

21. The device of Claim 20, in which the step of performing a simulation includes accessing a set of predetermined rules for the etch process.

23. A device that is formed on a wafer created by the acts of:

- reading a first set of mask/reticle data that defines at least one feature to be created lithographically;
- performing a simulation of the etch effects that would occur if a wafer is created using a mask/reticle corresponding to the first set of mask/reticle data;
- calculating etch biases from the etch simulation result;
- applying the etch biases within an optical process correction (OPC) loop that adjusts the mask/reticle data for optical/resist process distortions;
- exporting the adjusted mask/reticle data to a mask/reticle writer to create a corresponding mask/reticle; and
- using the mask/reticle to create the device on a wafer.

24. The device of Claim 23, in which the step of performing a simulation includes accessing a set of predetermined rules for the etch process.

25. The device of Claim 23, in which the step of performing a simulation includes accessing a table of predetermined values for the etch process.